

**REMARKS**

Claims 1, 2, 5-8 and 10-13 are all the claims pending in the application. Claims 3-4 and 9 have been deleted.

Referring to pages 2-5 of the Office Action, Claims 1, 2, 5-8 and 10-13 have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 6,447,958 to Shinohara ("Shinohara"). Although not stated in the Office Action, Applicants assume that the claims have been rejected over Shinohara, in view of U.S. Application No. 2003/0143464 to Yamamoto ("Yamamoto"), in light of the arguments set forth beginning at page 4, line 8 through page 5 of the Office Action.

Applicants traverse for the following reasons.

Independent Claim 1 is directed to a separator for non-aqueous electrolyte secondary battery, wherein the separator comprises a shut-down layer, a heat-resistant microporous layer, and a spacer having a form of particles, fibers, net or porous film on the surface of the heat-resistant microporous layer. The heat-resistant microporous layer comprises at least one heat-resistant resin selected from resins having a temperature of deflection under load of  $18.6 \text{ kg/cm}^2$  of  $100^\circ\text{C}$  or more. The spacer comprises a fluorine-containing polymer.

Independent Claim 12 is directed to separator for non-aqueous electrolyte secondary battery, the separator comprising a shut down layer, a heat-resistant microporous layer, and a spacer having a form of particles, fibers, net or porous film, on the surface of the heat-resistant microporous layer. The heat-resistant microporous layer comprises at least one heat-resistant resin selected from resins having a temperature of deflection under load of  $18.6 \text{ kg/cm}^2$  of  $100^\circ\text{C}$

or more, and the shut-down layer, the heat-resistant microporous layer and the spacer being in this order. The spacer comprises a fluorine containing polymer.

At page 3, lines 1-6 of the Office Action, it is asserted that “Shinohara teaches a separator comprising... and a thermoplastic spacer formed from a fine particle-like suspension (col. 10, lines 1-10).” At page 4, lines 6-7 of the Office Action, it is acknowledged that Shinohara “is silent to . . . a spacer of fluorine containing polymer.”

Yamamoto is relied upon to satisfy the deficiencies of Shinohara. In this regard, Yamamoto is relied upon for disclosing the equivalence of fluorine polymer and polyolefins as separator materials for electrochemical cells. *See* Office Action at page 4, 8-9. It is thus concluded that it would have been obvious “to employ the fluorine polymer of Yamamoto as the spacer material of Shinohara, because Yamamoto teaches the equivalence of each material at the time the instant invention was made and it would have been obvious to substitute the fluorine polymer of the polyolefin material.” *See* Office Action at page 4, lines 6-15.

However, although the spacer material of Shinohara may be utilized for imparting or reinforcing shut down property (*see* Shinohara at col. 10, line 1), the separator materials of Yamamoto are not used for imparting or reinforcing shut down property. Therefore, one having ordinary skill in the art would not be motivated to use the separator materials disclosed by Yamamoto as the spacer material in Shinohara.

Moreover, in the presently claimed invention, fluorine containing polymer and polyolefins are not equivalent. For example, as illustrated by the comparison between Example 3 and other Examples described of the present specification, Example 3, which uses fluorine

containing polymer as the spacer material, shows much lower static friction coefficient between the spacer-disposed separator surface and stainless steel surface ground by a 1000 grit polishing paper than that of other Examples (*see* page 29, Table 1 of the present specification).

Accordingly, by using fluorine containing polymer as the spacer material, as recited in the present invention, it is restrained more effectively. That is, the produced rolled electrode needs to be drawn out from the center core, however, if an undue force is applied to the rolled electrode, misalignment and unevenness in the electrode, and sometimes breakage of the electrode, may be caused. *See* present specification, from page 10, line 9, to page 11, line 4. Thus, the present invention results in unexpected results over the disclosures of Shinohara and Yamamoto.

Therefore, in view of the above, it is respectfully submitted that Claims 1, 2, 5-8 and 10-13 are patentable over Shinohara and Yamamoto, and accordingly, withdrawal of the rejection is respectfully requested.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

**RESPONSE UNDER 37 C.F.R. § 1.111**  
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Respectfully submitted,



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